

THE OCULAR COMPLICATIONS OF NASAL SINUS DISEASE.¹

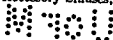
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THE most striking and probably the best known orbital complication of nasal sinus disease is that due to a dilatation of the frontal and ethmoidal sinuses without inflammatory signs, the so-called mucocoele, which causes a mechanical displacement of the orbital contents. The eyeball is generally uninvolved. The distention which the sinus undergoes is associated with rarefaction of the bone, usually of the inferior wall. On the other hand, in a case which I recently operated upon, the upper or cerebral wall of the frontal sinus was absent and the altered mucous membrane of the dilated sinus was directly adjacent to the dura of the anterior cranial fossa. The only treatment is operation, and is usually simple, as the long-standing displacement of the eyeball permits very free access to the nasal structures. The operation² consists in the removal of the lower wall of the frontal sinus and of the entire ethmoid labyrinth, thus permitting free drainage into the nose.

Inflammation of the sinuses is associated with external or orbital inflammatory signs whenever the inflammation invaded the intervening bony wall. In the mild cases there is no macroscopic change in the bone, but a periostitis is present over the floor of the frontal sinus with swelling and redness of the eyelid or over the ethmoidal os planum, causing exophthalmos. This condition may resolve of itself or on intranasal treatment. If the involvement of the bone is more active a discoloration or a circumscribed defect in the bone will occur usually in a typical site in the floor of the frontal sinus or at the ethmoidal os planum. The pus thus gains its way to the periosteum and forms a subperiosteal orbital abscess which either remains encapsulated or may extend forward and perforate the skin of the eyelid; the suppuration may then cease, the wound heal, or a purulent fistula remain. The orbital contents are generally not involved in these cases beyond slight venous congestion at the optic disk, as the periosteum is easily detached from the bone and protecting granulations spring up.

Subperiosteal orbital abscesses are not infrequent in children, the infection being transmitted by the ethmoid labyrinth. In operating upon these cases a curved incision is made along the inner orbital margin; on retracting the periosteum the small collection of

¹ Read at a meeting of the New York Academy of Medicine, December 3, 1908.² Arnold Knapp, *The Surgical Treatment of Orbital Complications in Diseases of the Nasal Accessory Sinuses*, Jour. Amer. Med. Assoc., July 25, 1908.

pus will be encountered between the periosteum and the bone and usually a small irregular defect in the os planum. The opening in the bone should be slightly enlarged and the contiguous ethmoidal cells curetted; the case then heals without deformity.

If the orbital periosteum itself is invaded, which is most likely in the places where it is normally adherent, as for the passage of vessels, involvement of the orbital structures results, cellulitis or abscess. The optic nerve becomes inflamed and the ophthalmoscopic changes at the nerve head may be more pronounced on the nasal side. This was especially noticed in one of my cases in which the lesion in the orbital periosteum corresponded exactly to an area of necrosis just below the posterior ethmoidal foramen. The orbital condition recovered after the ethmoidal focus was removed.

The important and preponderating part played by nasal sinusitis in producing orbital cellulitis and abscess has, strange to say, only been recognized within the last years. Birch-Hirschfeld,² in an elaborate statistical research, concludes that nearly all orbital inflammations are caused by nasal sinus empyema. Under these circumstances the usually practised blind incisions into the orbital cavity are not surgical; the treatment should be based on the lines of the orbital operation for nasal sinus empyema, aiming at broad exposure by an incision along the orbital margin, careful inspection of the orbital walls, and proper drainage according to the individual case.

The importance of the maxillary antrum in causing orbital complications has in my mind been exaggerated. Disease of the antrum itself rarely seems to cause an orbital complication unless through the intermediation of the ethmoidal cells. The extension much more frequently follows a periostitis of one of the walls, as after an alveolar abscess. Thrombophlebitis of the orbital vessels, according to Uhthoff, is unusual after accessory sinus disease, and is more frequent from extension of a process in the face.

A very important group of ocular complications of nasal sinus disease are those of the optic nerve. That the optic nerve sometimes suffers in sphenoidal sinusitis has been known for some time, and brilliant cases of restoration of sight have been recorded by Holmes and others by timely treatment of the sphenoidal sinus. The recent investigations of Onodi⁴ have shown that the optic nerve frequently is in close relation to the posterior ethmoidal cells and that the extreme thinness of the intervening wall makes the involvement more likely than in the case of the sphenoid. Cases have been observed that bear out the frequency of this involvement. Of especial interest is that the optic nerve is involved in the form known as retrobulbar neuritis in which a central scotoma is the characteristic functional defect. It is not known why this particular bundle of optic nerve

² Versamml. Deut. Naturf. und Aerzte, Dresden, 1907.

⁴ Der Sehnerv und die Nebenhöhlen der Nase, Vienna, 1907.

fibers is first and principally involved. The optic nerve shows in the beginning no ophthalmoscopic changes unless the nasal infection is situated in the anterior ethmoidal cells, as in a recent case of well-marked papillitis with central scotoma, which I had the opportunity of following together with Dr. Coakley. The prognosis in these cases is excellent, and now that ophthalmological attention has been focussed on this interdependence of the nose and the eye, some of the hitherto obscure cases of acute retrobulbar neuritis will be recognized and nasal treatment promptly instituted.

Ocular paralyses are not infrequently the only manifestations of orbital complications. In a case of grippe with ethmoidal involvement which came under my observation the internal rectus for a time was parietic.

Neuralgia, especially ciliary and retrobulbar, is frequently due to sinus affections, and asthenopia is a common symptom. According to Kuhnt,⁵ muscular asthenopia, accommodative asthenopia, and contraction of the visual field, are the functional disturbances observed in nasal empyema in the order of their frequency; he believes them to be due to absorption of toxins from the purulent focus in the sinus.

There is a group of eye affections comprising iridochoroiditis, glaucoma, and detachment of the retina, with which certain authors have brought sinus disease in etiological relation. Some over-enthusiastic observers have even cured these conditions by surprisingly insignificant operations on the nasal sinuses. This is a subject upon which we require additional information. Kuhnt, whose experience is surely great, states in the above-quoted article that he has never seen a case of iritis or choroiditis caused by sinus disease, but thinks that cyclitis, especially the form chiefly characterized by opacities of the vitreous, can depend on this cause. He has never observed glaucoma to be caused by nasal disease, but believes that in predisposed eyes an attack may be brought on by a sinus affection. A number of cases of this kind have been observed. The reported cases of detachment of the retina associated with nasal sinus disease are not convincing.

That the list of ocular disturbances which can be produced by sinus affections is not exhausted there can be no doubt, and a great deal of careful work needs still to be done to complete our knowledge of the relation of nasal sinus disease to disease of the eye.

⁵ Deut. med. Woch., 1908, No 37.